

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 18, 21, 23-25, 27-31, 33 and 36-58 are pending, with Claims 18, 21, 27, 28, 29, 33 and 38 amended, and Claims 37-58 withdrawn from consideration.

In the Official Action, Claims 37-58 were the subject of a constructive election; Claims 25 and 31 were rejected under 35 U.S.C. § 112, first paragraph; Claims 18, 27-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Furuya (U.S. Patent No. 4,888,767, hereinafter "Furuya") in view of Nokia (WO 99/01950); Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Furuya and Nokia in view of Schramm (U.S. Patent No. 6,208,663); Claims 21, 23 and 28-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Raitola (U. S. Patent No. 6,317,418) in view of Furuya and Chuang (U. S. Patent No. 6,823,005); and Claims 25 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schramm in view of Boivie (U. S. Patent No. 6,625,773) and Seddigh (U. S. Patent No. 7,035,214).

Applicants traverse the rejection under 35 U.S.C. § 112, first paragraph, and note that one of skilled in the art would know that the claimed transmission scheme includes packet identifiers that enable the transmitter and receiver to identify specific packets for acknowledgement. In response to a retransmission request from a first mobile station, a second mobile station who has received the packet correctly will know that the retransmitted packet is a repeat by virtue of a packet identifier. Applicants note that the background section of Applicants originally filed specification describes basic ARQ operations. Additional details are found on page 24, lines 7-23.

Applicants traverse the outstanding restriction and note that Claims 37-58 correspond to original Claim 3 albeit amended to more clearly describe a distinctly claimed Applicants' invention. Indeed original Claim 3, dependent on original Claim 1, recited:

a multicast transmission method in a multicast transmission system in which the same information is transmitted from a base station to a plurality of mobile stations, said multicast transmission method comprising the steps of:

a mobile station in said mobile stations sending a retransmission request signal to said base station when said mobile station detects an error in a received multicast signal; and

said base station judging whether a received signal indicates a retransmission request according to receiving quality of said received signal, and retransmitting a multicast signal corresponding to said retransmission request when said received signal indicates said retransmission request,

wherein said mobile station sends spreading code as said retransmission request signal, and said base station obtains receiving quality of said spreading code, and said base station judges that said received signal is said retransmission request when said receiving quality is greater than a threshold.

By comparing Claim 37 to Claim 3 one can note that Claim 37 and Claim 3 each recite a mobile station sending spreading codes as a retransmission request signal when the mobile station detects an error in a received multicast signal. Claim 37 recites the base station obtains a correlation value of the spreading code by using a correlator whereas Claim 3 recites the base station obtains a quality of the spreading code. Applicants submit that Claim 37 more narrowly and clearly defines the receiving quality recited in original Claim 3 by describing that a correlation of value, which is a quality measure, is obtained by way of a correlator. If the Examiner insists that Claim 37 is directed to unelected subject matter, Applicants will gladly redraft Claim 37 to be an identical copy to original Claim 3 albeit further amended to recite that said quality corresponds to a correlation value obtained via a correlator. Thus, Applicants request that the Claims 37-58 be rejoined.

Claims 18, 27 and 33 are amended to more clearly describe Applicants' invention. Support for these amendments is found in Applicants' originally filed specification.¹ Claims 21, 28 and 29 are amended to more clearly describe Applicants' invention. Support for these amendments is found in Applicants' originally filed specification.² Claim 38 is amended to remove a typographical error. No new matter is added.

Furuya describes that in a variable modulation communication method, transmission quality of a transmission path is monitored. If the quality is good, communication is performed while the transmission time is shortened by using a multilevel modulation scheme. If the quality is bad, communication is performed while transmission time is prolonged by using a modulation scheme having a smaller number of levels than the multilevel modulation scheme.³ However, as acknowledged in the Official Action, Furuya does not disclose or suggest a directive antenna as recited in Claims 18, 27 and 33.

Nokia describes the device interprets a transmitted signal from signals obtained at a reception end of an antenna vector including several antenna elements. The signal is interpreted in two steps. In the first step, directed signal beams are formed of the multidimensional signal obtained from the antenna vector. In the second step, the directed signals are input to an optimum merger which deduces the transmitted signal from several signal branches used as an input.⁴

However, Nokia does not disclose or suggest determining, at the base station, a directivity of a base station antenna *by multiplying weights so as to separate an incoming wave of the one mobile station from waves of a remainder of the plurality of mobile stations* as recited in amended Claims 18, 27 and 33. Thus, Nokia does not disclose or suggest increasing, based on an obtained weight, a base station antenna gain for the mobile

¹ Specification, page 22, line 23 – page 23, line 21.

² Specification, page 25, line 37 – page 27, line 31.

³ Furuya, Abstract.

⁴ Nokia, Abstract.

station that sends the retransmission request signal; nor retransmitting the multicast signal to the mobile station using the directivity. As noted in the Official Action, Nokia only describes a time domain method of antenna directivity control. Thus, Applicants submit that amended Claims 18, 27 and 33, and all claims depending therefrom, distinguish over the combination of Furuya and Nokia.

Raitola describes a method for transmitting packet switched data in a mobile communications system using an ARQ protocol. In the method the receiver requests, if necessary, retransmissions of the originally sent transmission unit, until the quality of the combined transmission unit formed of the originally sent transmission unit in its retransmitted copies corresponds to a predetermined quality level. The signal is not detected until after this occurs. If the packet is interleaved and encoded and is found out that the packet is not faultless, retransmission of the transmission units of the packet that are of the poorer quality are requested.⁵ However, as acknowledged in the Official Action, both Furuya and Raitola fail to disclose or suggest the threshold measurements of Claims 21, 28 and 29.

Chuang describes a method and a system for dynamically adapting the modulation and coding schemes for radio links in a wireless communications network based on a retransmission environment model in order to maximize throughput and most efficiently allocate bandwidth resources. The device includes a refined calculus and methodology for deriving link adaptation thresholds in a retransmission environment using a complex model and analysis of the retransmission environment. The device includes a “no transmission” cutoff mode that is selected for signal-to-interference ratios below a threshold value. This new mode prevents system instability in this allocation of bandwidth in a wireless communication system.⁶

⁵ Raitola, Abstract.

⁶ Chuang, Abstract.

However, Applicants traverse the assertion that Chuang cures the deficiencies of Furuya and Raitola. However, to make further progress toward allowance, Claims 21, 28 and 29 are amended to clarify that the retransmission request is generated and then either sent immediately or stored for future transmission. Applicants submit that Chuang, Furuya and Raitola each fail to disclose or suggest the following features of Claims 21, 28 and 29:

- comparing, at the mobile station, the receiving quality to a predetermined value when the mobile station detects an error in the multicast signal;

- sending from the mobile station a retransmission request signal when the error is detected and the receiving quality is better than a predetermined value;

- storing at the mobile station stores the retransmission request signal when the error is detected and the receiving quality of not better than a predetermined value, continuing to monitor the receiving quality, and sending the stored retransmission request signal when receiving quality becomes better than a predetermined value.

Schramm discloses a communication system that supports multiple modulation/coding schemes. When connection quality drops below an acceptable threshold, ARQ techniques use an alternative modulation/coding scheme which is more resistant to noise and/or interference. With Schramm, flexible resegmentation and mapping of information blocks is supported.⁷

Boivie describes a multicast communication system that follows a protocol including (1) determining a next hop for each destination node listed in a packet received; (2) partitioning the destination nodes into groups according to the next hop; (3) replicating the packets such that there is at least one copy of the packet for each of the next hops; (4) modifying the list of addresses for the destination node such that the list of addresses for each of the next hops includes only the addresses for the destination nodes to be routed in that next

⁷ Schramm, Abstract.

hop; and (5) transmitting the modified copies of the packet to the next hops found in the previous steps for routing to the addresses included in each packet.⁸

Seddigh describes a system and method for transmitting data in a data communications network using a transmission control protocol so as to provide reduced acknowledgement control traffic, error recovery and congestion control. A communications link is established between a transmitter and a receiver. Setting the communications link includes setting a network congestion window to an initial length. A sequence, or stream, of data packets is sent from the transmitter to the receiver. The receiver detects any missing packets, by examining the sequence numbers of the incoming packets, and sends negative acknowledgements, generally no more than four, to the transmitter identifying the missing data packet. When the transmitter receives a negative acknowledgement, it decreases the length of the congestion window, and retransmits the missing packet. Detection and use of round-trip time, retransmission time-outs are provided.⁹

However, contrary to the Official Action, Schramm, Boivie and Seddigh each fail to disclose or suggest a mobile station configured such that, if the mobile station receives a retransmitted multicast signal without an error, the mobile station does not perform error detection for a multicast signal which includes the same information as the retransmitted multicast signal and which is further retransmitted after receiving the retransmitted multicast signal. None of the applied references includes logic for discerning whether a retransmitted multicast packet is a packet that was previously received without error.

MPEP §706.02(j) notes that to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the

⁸ Boivie, Abstract.

⁹ Seddigh, Abstract.

art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Also, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Without addressing the first two prongs of the test of obviousness, Applicants submit that the Official Action does not present a *prima facie* case of obviousness because all of the applied references fail to disclose all the features of Applicants' claimed invention.

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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